

THE ECONOMIC IMPACT OF HIV/AIDS IN AFRICA: WITH SPECIAL EMPHASIS ON  
BOTSWANA

by

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## **Abstract**

This essay on AIDS examines the possible economic impact HIV and AIDS can have on an economy. AIDS is a growing problem throughout the world and has become one of the worst pandemics of the 21st century. Africa is one of the worst hit regions in the world, having seven countries with more than 15 percent of the population infected. This essay will have special emphasis on Botswana where 37.3 percent of the population is infected. Botswana has had various negative micro-level economic impacts which have begun to spillover and negatively affect macro-level economics. The International Monetary Fund predicts GDP growth is expected to fall from 5.5 percent a year without AIDS to between 1.5 and 2.5 percent a year with AIDS. There are various sectors in an economy that can be impacted by AIDS. This essay will look at factors affecting these various sectors, explain them and describe what impact they are having on Botswana's economy.

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## CHAPTER 1 - Introduction

“The fight against HIV/AIDS requires leadership from all parts of government and it needs to go right to the top. HIV/AIDS is far more than a health crisis. It is a threat to development itself.”<sup>1</sup>

-Kofi Annan

“The heart of the security agenda is protecting lives - and we now know that the number of people who will die of HIV/AIDS in the first decade of the 21st Century will rival the number that died in all the wars in all the decades of the 20th century.”<sup>2</sup>

-Al Gore

HIV/AIDS has become one of the worst killers in the modern day world. The HIV/AIDS pandemic was discovered roughly 25 years ago, and since then has had an astounding negative impact on every country in the world. According to United Nation Development Program (UNDP), the disease has inflicted the single greatest reversal in human development in modern history. Africa, Asia, and Latin America have been hit the worst by the pandemic, accounting for roughly 85% to 90% of total world infections<sup>3</sup>. The focus of this essay will be to examine the impact of HIV/AIDS in Africa. According to the Overseas Development Institute (ODI) and UNAIDS there are roughly 33.2 million Africans infected with HIV/AIDS<sup>4</sup>. The number of infected persons in Africa accounts for roughly 70% of the world's total infected population.

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<sup>1</sup> See Work Cited: Better World, N.D.; Pg. 1.

<sup>2</sup> See Work Cited: Better World, N.D.; Pg. 1.

<sup>3</sup> See Work Cited: Avert, 2008; Pg. 1

<sup>4</sup> See Work Cited: Overseas Development Institute, 2007; Pg. 1.

Also, according to the United States Institute of Peace roughly 17 million Africans will die from the HIV/AIDS or an HIV/AIDS related illness by 2010<sup>5</sup>. Due to the huge predicted loss of life, many countries around the world are hurrying to combat the growing problem. While focusing on Africa and Botswana this essay will look at what HIV/AIDS is and does, its prevalence in Africa and Botswana, its impacts on the labor force, population demographics, effects on the economy, firms, education, households, and look at possible recommendations to solve the growing problem. By the end of the essay the objective is to better understand the growing problem and how it affects modern economies.

## **The HIV/AIDS Pandemic**

HIV/AIDS, which stands for Acquired Immune Deficiency Syndrome (AIDS), is a “set of symptoms and infections resulting from the damage to the human immune system caused by the Human Immunodeficiency Virus (HIV). This condition progressively reduces the effectiveness of the immune system and leaves infected individuals susceptible to opportunistic infections”.<sup>6</sup> The HIV/AIDS virus is spread through various forms of body fluid contact. In the world today there are almost 40 million people infected, and this number is steadily increasing every year. Currently there are no vaccines or cures for the virus, although there are antiretroviral medications which can slow the virus’s progress. The antiretroviral medication is costly, which makes it difficult for less developed countries to obtain them. Due to this there is a much higher HIV/AIDS death rate for less developed countries than for that of developed countries. Below is a graph depicting the course of the virus from the point of infection to death. From the graph one can notice the disease progresses quickly, shown by the rapid drop in Lymphocyte cells.

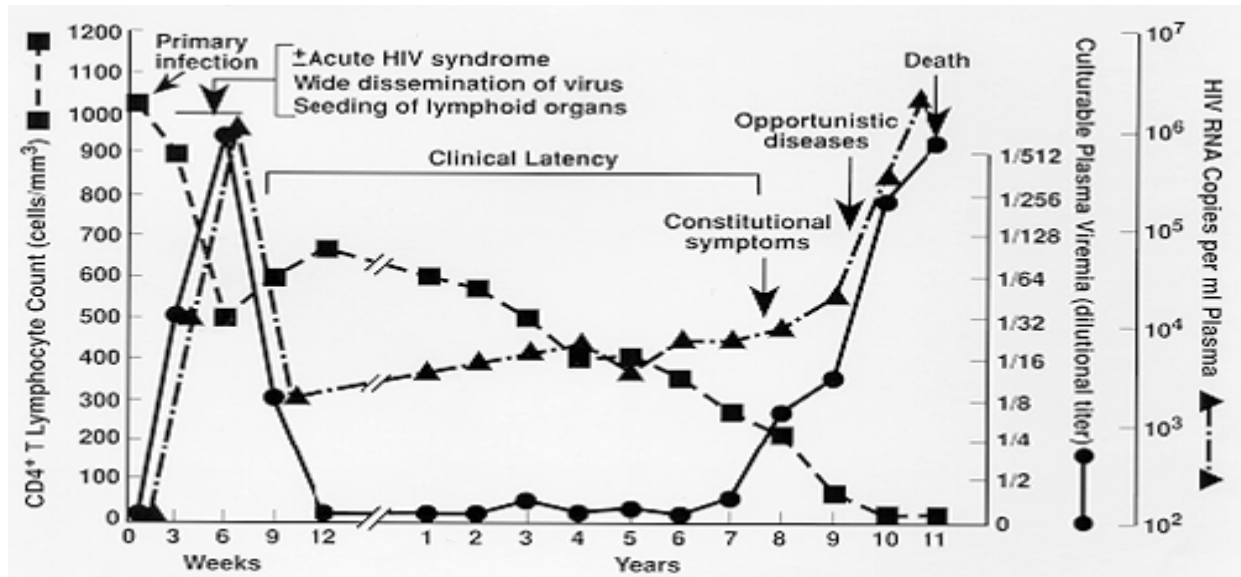
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<sup>5</sup> See Work Cited: Docking, Timothy, 2001; Pg.1.

<sup>6</sup> See Work Cited: AIDS, 2009; Pg. 1.



Following this decrease in Lymphocyte cells, HIV and Ribonucleic Acid copy seeds in the lymphoid organs and progressively lower the Lymphocyte cell count until death. Most people infected with the HIV/AIDS virus will live between ten to fifteen years after their initial infection unless they have the help of antiretroviral medicines and a healthy diet.



**Figure 1.1: The Relationship between the Human Immunodeficiency Virus and the Acquired Immunodeficiency Syndrome**

**Source:** National Institute of Allergies and Infectious Diseases, N.D.; Pg. 1.

During the years after a person is infected, the HIV/AIDS virus begins affecting the immune system's ability to fight common viruses, such as the flu, pneumonia, or a common cold, which a healthy person would be able to overcome with common medication. The HIV/AIDS virus affects all organs of the body and as the above graph depicts, the disease can lead to death quickly if not treated with proper antiretroviral medication. Due to the quick onset of symptoms, many people infected with the virus are unable to perform day to day activities 5 to 7 years after the initial infection if not treated. The health problems infected people face will

cause a great burden on their day to day life. People who are infected not only suffer personal problems due to being sick; the illness also places a large burden on loved ones, jobs, and the economy in general.

## **HIV/AIDS in Africa**

HIV/AIDS is a global pandemic affecting all regions of the world. Although this disease affects all areas the data seems to show that Sub-Saharan Africa has been hit the worst. As discussed earlier, there are roughly 33 million Africans infected with HIV/AIDS and currently, HIV/AIDS is the leading cause of death in Africa.<sup>7</sup> There are several reasons for Africa's severe problem with the HIV/AIDS pandemic. Civil unrest, territorial wars, rape, lack of education, poverty, female status, male migration, poor health care, and nutrition all account for the spreading of the HIV/AIDS virus. Over the past 20 years Rwanda, Sierra Leone, Congo, and Nigeria, just to name a few, have been in lengthy conflicts in which crimes against humanity were present. During these tough times, HIV/AIDS was often passed through rapes or bodily fluid contact.

Furthermore, in less developed countries the outlook and status of females in the society predict how they are treated. In Africa, females do not have the same societal status that females have obtained in developed countries. Many times the husband or boyfriend will force them to perform actions in which they do not want to be involved. Females are also less likely to obtain an education, which might prevent them from resisting intercourse, using protection, or outright leaving. Also, males will often travel for extended periods of time following mining, construction, or transportation jobs. A study done in Cameroon indicated that truck drivers

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<sup>7</sup> See Work Cited: Overseas Development Institute, 2007; Pg. 1.

averaged 14 days away from their family each trip and 25% said they had sex every night while on the road.<sup>8</sup> After returning home from promiscuous trips, these men have a greater chance of having the HIV/AIDS virus and possibly infecting their wives or girlfriends. According to data 57% of all infected in Africa are female. Lastly, Africa's health care system lacks funding to combat the HIV/AIDS pandemic. Antiretroviral medication is very expensive and only through outside funding is Africa able to attempt to fight HIV/AIDS. Over the past six years, from 2002-2008, the amount of HIV/AIDS relief has climbed tremendously. Over these past 6 years global funding has climbed from \$1.6 billion to \$8.6 billion annually. This has helped slow the virus's impact on affected countries, but this is only a fraction of the money needed to fully treat the problem.

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<sup>8</sup> See Work Cited: Stover, John., Bollinger, Lori, 1999; Pg. 8.

Many African countries have a large percentage of their total population which is HIV/AIDS positive. Seven countries in Africa have HIV infection rates higher than fifteen percent and as shown on the graph below, many other African countries are close to the ten percent mark.

Column1	Column2	Column3	Column4
Swaziland 38.8	Tanzania 8.8	Chad 4.8	Eritrea 2.7
Botswana 37.3	Gabon 8.1	Ethiopia 4.4	Sudan 2.3
Lesotho 28.9	Cote d'Ivoire 7.0	Burkina Faso 4.2	Benin 1.9
Zimbabwe 24.6	Cameroon 6.9	Dem. Rep. Congo 4.2	Mali 1.9
South Africa 21.5	Kenya 6.7	Togo 4.1	Madagascar 1.7
Namibia 21.3	Burundi 6	Uganda 4.1	Gambia 1.2
Zambia 16.5	Liberia 5.9	Angola 3.9	Niger 1.2
Malawi 14.2	Nigeria 5.4	Guinea 3.2	Senegal 0.8
Cent. Africa Rep. 13.5	Rwanda 5.1	Ghana 3.1	Mauritania 0.6
Mozambique 12.2	Congo 4.9	Djibouti 2.9	

**Table 1.1: African Adult HIV Infection Rates (%) End of 2003**

Source: Cook, 2004; Pg. 2.

The table above reveals very troubling information. Every African country has a problem with HIV/AIDS and nine out of the top ten countries in Africa are all South African countries. Swaziland 38.8%, Botswana 37.3%, Lesotho 28.9%, Zimbabwe 24.6%, South Africa 21.5%, Namibia 21.3%, Zambia 16.6%, Malawi 14.2%, and Mozambique 12.2% all have extremely high HIV/AIDS infection rates. With rates this high, African countries are going to see both short and long term economic problems.

Also to note, one might be spectacle about the numbers presented by each country. Many factors might play a role in over and under estimating the true number of infected people within

a country. Governments might underestimate the number infected to portray control over the problem. Other governments might overestimate the number infected to increase international funding. Also, some countries religious affiliation might encourage leaders to convey false statistics.

## **CHAPTER 2 - Demographic Problems Associated with HIV/AIDS**

### **General Outlook**

The demographic makeup of a country is important and useful information for political leaders and advisors. Demographic information allows policy makers to quantify individual cohorts within their country in order to make educated and informed policy decisions. Demographic information includes age, gender, race, income, educational levels, and so on. Since the onslaught of the HIV/AIDS pandemic in Africa, the demographics of every Sub-Saharan country have changed. In a study done by the United Nations Department of Economic and Social Affairs/Population Division<sup>9</sup> it was shown that there were differences in the life expectancy, number of deaths, infant mortality rates, and child mortality rates since the onset of the pandemic. After looking at the data between 1995-2000 and 2020-2025 there is an expected 3 million more deaths per year, a 17 year loss in life expectancy, and the crude death rate increased 11 per 1000<sup>10</sup>, and child mortality increased 11 per 1000<sup>11</sup>. When countries see a change in such statistics it begins to morph the demographic structure of the country. Normally when life expectancy begins to decline, populations are faced with a larger young population and a smaller older population. This alone causes several economic problems. First, the working population changes from the standard 16-65 years of age. Secondly, certain educational groups will be affected, normally the higher and lower educational groups. Both of these outcomes have an impact on the countries labor force.

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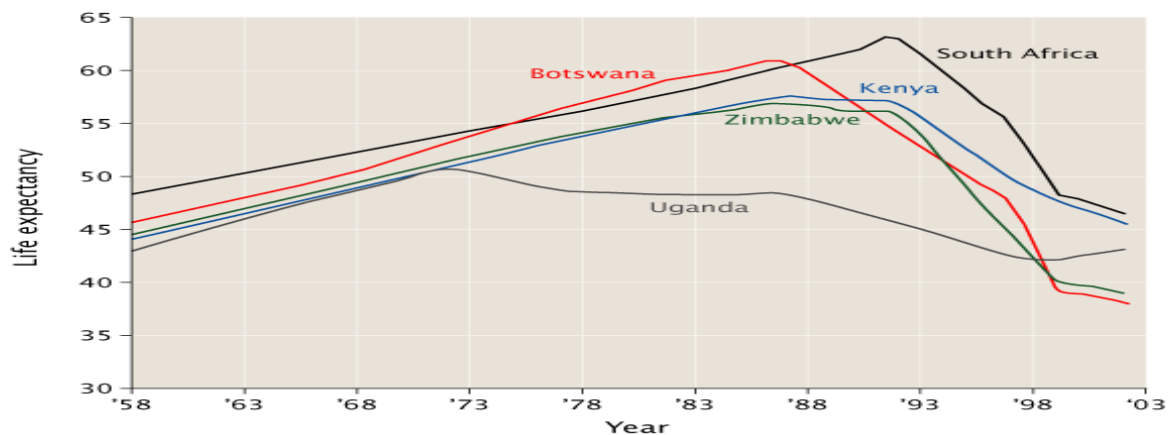
<sup>9</sup> See Work Cited: The Impact of AIDS, 2004; Pg. 16.

<sup>10</sup> Crude death rate: The crude death rate is the number of deaths occurring among the population of a given geographical area during a given year, per 1,000.

<sup>11</sup> All figures are given in absolute values between time periods 1995-2000 to 2020-2025.

## Labor Force

The labor supply of a country is one of its main driving forces and without a good, healthy workforce economic progress is slowed. The HIV/AIDS pandemic is the worst pandemic of the 21<sup>st</sup> century and has severely plagued all economies in which it has affected. The labor force of a country is normally comprised of all citizens who are between the ages of 16-65 years of age. The HIV/AIDS pandemic is changing the composition of the work force in many Sub-Saharan African countries. As discussed before, the average life expectancy has dropped by 17 years on average in Africa. If you look at the figure below you will see how these 5 countries, South Africa, Botswana, Kenya, Zimbabwe, and Uganda, all have seen a decrease in their possible workforce due to lower life expectancy.



**Figure 2.1: Changes in Life Expectancy**

**Source:** Economic Impact of HIV/AIDS, 2003; Pg. 1.

As shown by figure 2.1 all 5 countries have seen a reasonable drop in life expectancy in the past 15 years and 4 out of the 5 have seen roughly a 20 year drop in life expectancy. This

drop is shrinking the labor force and is causing several problems. First, as older workers pass away, an economy is going to lose many educated, trained, and experienced workers. Secondly, to make up for this loss employers will have to hire younger, less-educated worker, which creates even more intricate problems. These younger employees will be less experienced which may decrease productivity and create unwanted cost for the employer. In addition many times children will be forced out of school and this has severe long-run implications. Lastly, worker productivity and output will begin to decline as they become ill, take sick days, or see doctors. Firms in this economy are going to have to trade skilled labor for unskilled labor. The firm's employee turnover is then increased which increase will cost. All implications just mentioned are going to hurt a firm's ability to be competitive and thus hurt the economy.

Africa also has a large informal economy and countries rely heavily on agriculture as both a means of survival and as a main export. As farmers become ill their ability to work the fields will decrease. Many farms in Africa are subsistence farms or a collection of farms with little machinery. So as a farmer begins to become ill or passes away, farms begin to produce less and sometimes fail. Again to keep this from happening, families pull children from schools and this causes more long-term problems.

Also worth mentioning is the impact a countries labor force has on a firms factors of production. Factors of production are productive resources that allow firms to produce goods and services. They include land, labor, and capital goods, which include investment and human capital. In this section we are most interested with the impact HIV/AIDS is having on the labor side of factors of production. As discussed above HIV/AIDS has decreased the amount of available participants in the labor force due to the decrease in life expectancy and absenteeism.



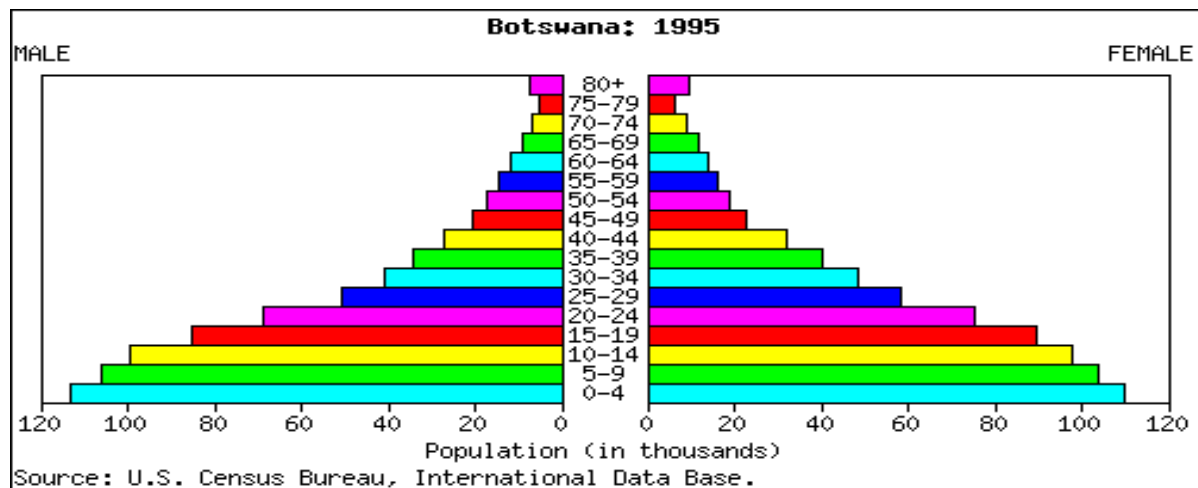
Also, as older educated employees pass away they take with them human capital. When an economy has a reduction in human capital and a reduction in the amount of available workers it makes it much more difficult for economic growth. As factors of production begin to dwindle it forces economies to switch to other factors of production which less developed countries do not have the ability to do.

## **Botswana**

The demographics and labor supply in Botswana has not been hit as many other African countries have, but they still have been sufficiently affected. To begin HIV/AIDS has impacted the demographic structure of the country. Botswana has around 38% of its population infected and future predictions forecast possible growth in this statistic for a couple more years. Due to this high rate many people are dying at a much younger age. As shown in Figure 2.1, Botswana has seen a 20 year decrease in life expectancy. Currently the median age is right around 22 years of age.<sup>12</sup> From Figure 2.2 and 2.3 one can see the impact HIV/AIDS has had on Botswana's population.

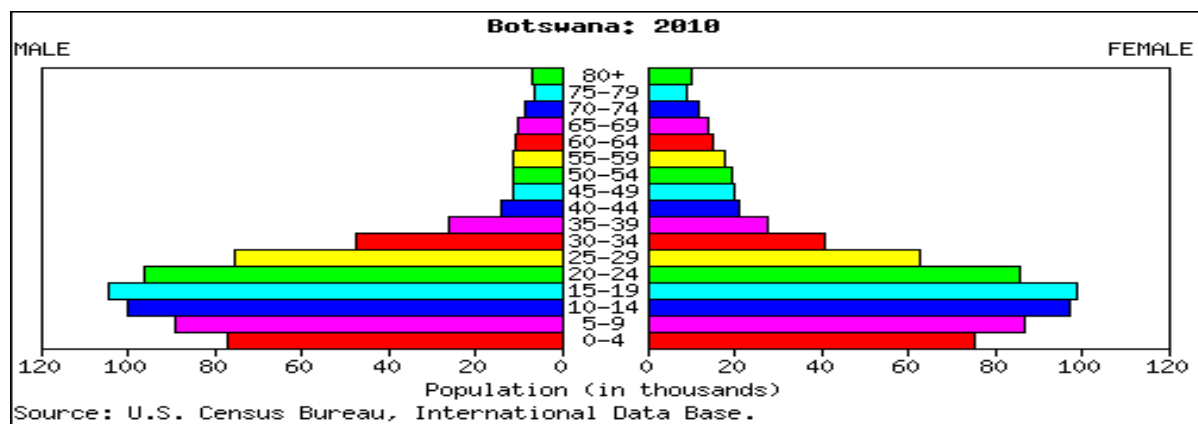
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<sup>12</sup>See Work Cited: CIA, N.D.; Pg. 1.



**Figure 2.2: Botswana Population Pyramid 1995**

**Source:** U.S. Census Bureau Population Division, N.D.; Pg. 1.



**Figure 2.3: Botswana Population Pyramid 2010**

**Source:** U.S. Census Bureau Population Division, N.D.; Pg. 1.

From 1995 to 2010 Botswana's population has become proportionally made up of younger people. Although it is very difficult to find data on the average age of workers it seems logical to assume from the population pyramids that the average employee age is decreasing. Also, a study done by Econsult, a company from South Africa contracted by Botswana to study the economic impact of AIDS, created a model to predict the impact HIV/AIDS will have by

2020. The study showed that productivity of workers has dropped 15% if the employee is using antiretroviral drugs and 40% with no antiretroviral medication. They also predicted there would be a 300,000 person difference in the number of workers in the labor force due to HIV/AIDS<sup>13</sup>. Furthermore, the study showed that between 1994 and 2002 there was roughly 2% less skilled employees in the job market.

As one can see, Botswana's demographics have been impacted by HIV/AIDS and this has a direct impact in the factors of production. Figure 2.1 through figure 2.3 show how life expectancy is decreasing and demographic composition of the country is becoming younger. These two trends are causing the labor force to shrink, it is estimated that there will be 300,000 less workers. Also, the amount of human capital is decreasing shown by the 2% drop in educated employees. This will hurt future economic which will be seen in Chapter 8 when we look at current economic trends.

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<sup>13</sup> See Work Cited: Jefferis, Keith, 2006; Pg. 39.

## CHAPTER 3 - Household Problems Associated with HIV/AIDS

Although not a formal sector of an economy, households are also impacted by the HIV/AIDS pandemic. Households encompass the social fabric of an economy and quite possibly might be the most affected by a pandemic such as HIV/AIDS. In many African countries, extended families live together under one roof and provide for one another. When an adult becomes sick, he or she will either not be able to work or will not be able to work to their full capacity which will affect a family in several different ways. First, when adults become sick or die there will be a loss in household income. Second, household costs will start to increase. These costs could include medical visits, antiretroviral medication, and funerals, which are all very expensive. This will have extreme negative impacts on households in Botswana. Econsult estimates that a household income will drop 45% when a person is infected with HIV and medical cost will again lower it another 5%. The biggest economic concern with a country of 300,000 infected people is that the average poverty level is 33% and as shown in table 3.1 many areas of Botswana have much higher rates of poverty.

Region	Poverty
Gaborone	0.07
Francistown	0.15
Other Cities & Towns	0.15
Rural South East	0.33
Rural South West	0.42
Rural North East	0.46
Rural North West	0.53
National Average	0.33

**Table 3.1: Poverty Rates by Region in Botswana**

**Source:** Jefferis, Keith, 2006; Pg. 67.

The effect of the increased cost will push many families below the poverty level. Moreover, in many cases both parents are dying from HIV/AIDS and the children are either dependent on extended family or become orphans. It is estimated that 161,000 orphans live in Botswana due to HIV/AIDS<sup>14</sup> and roughly 48% of Botswana's population is under the age 18<sup>15</sup>. This is going to cause the Botswana dependency ratio<sup>16</sup> to dramatically increase.

To conclude on the impact HIV/AIDS is having on households, it is hard to quantify or predict what future statistics will be due to other outside variables such as foreign aid. Although it is clear that income will decrease and costs will increase. Also, human capital and social capital will decline as discussed at the end of Chapter 3. The loss of life due to HIV/AIDS will decrease the overall knowledge and work force available. If household survival is the outcome and the factors of production are as discussed earlier, households will begin to fail. If this were to happen it will push many families below poverty levels. As income drops, saving and investment will likely drop to pay for expenses and necessities. Government spending will have to adjust and offer social support for poor families and orphaned children.

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<sup>14</sup> See Work Cited: Kingborn, Anthony., Coombe, Carol., McKay, Elaine., Johnson, Saul, 2002.

<sup>15</sup> See Work Cited: Stover, John., Bollinger, Lori, September 1999; Pg. 4.

<sup>16</sup> Dependency Ratio: In economics and geography the dependency ratio is an age-population ratio of those typically not in the labor force (the dependent part) and those typically in the labor force (the productive part). In published international statistics, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15 – 64. It is normally expressed as a percentage. This ratio is important because as it increases, there may be an increased cost on the productive part of the population to maintain the upbringing and pensions of the economically dependent. There are direct impacts on financial elements like social security. Source: Dependency Ratio.

## **CHAPTER 4 - Economic Impact on Firms caused by HIV/AIDS**

All firms in today's modern economy have to balance numerous input costs to stay in business. Africa's mining, manufacturing, and corporate business are all battling the impacts of HIV/AIDS. The devastating disease is affecting firms in many different ways. Companies are having multiple labor force problems, new costs are forming, productivity and profitability are fluctuating, and firms have noticed an indirect impact which seems to affect its ability to maintain a profitable enterprise. Many firms have redesigned themselves since the pandemic has changed the African business world; some are taking an active approach while others seem to be taking a more passive approach.

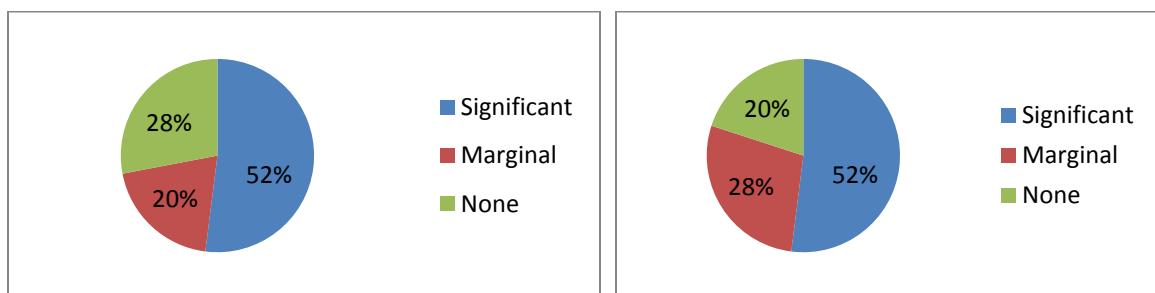
### **Labor Force Problems**

To begin, we will look at some of the main problems affecting the labor force in Africa since it seems to be the biggest problem. One of the main goals of any organization is to control cost and data shows that HIV/AIDS has significantly raised costs. Employee turnover, training, health care, and wages have all increased over the duration of the HIV/AIDS pandemic. First, as employees become absent from work either from being sick or have passed away, employers have had to find temporary workers or replace employees all together. This increases cost in several ways. As employers replace workers they are required to train new employees or use existing employees to work longer hours, which can cost overtime. Also, the more seniority and experience an employee has, the more effect his absence has on a company. This is due to the amount of human capital he is taking with him. In a study done by Econsult on 25 firms from various industries it was shown that on average in the past 2 years each company lost 30 workers due to death, 19 to illness, and 30 had been on sick leave. Although these numbers are not in the

hundreds, they do show that HIV/AIDS is keeping employees from working to their full capacity which is the next problem HIV/AIDS is causing.

## Productivity and Output Problems

Productivity and output are two other key indicators that show HIV/AIDS is having an effect on the ability of firms to be competitive. A decrease in both productivity and output can be directly related to the fact that experienced employees are either not working or have died, taking with them knowledge and job experience. Although another cause for the decrease in employee productivity could be related to employee attitude. As friends or co-workers get sick or die two different attitudes could be created. First, employees might feel depressed from experiencing the loss of a co-worker which could possibly decrease productivity. Secondly, some employees might begin to feel burdened or mad that they are responsible for picking up the slack that other employees left behind. Overtime might be overwhelming or tiring and cause production to decrease. Again, out of the same study done by Econsult, companies were seeing production and output dropping.



**Figure 4.1: Impact on Output (Right) and Productivity (Left) caused by HIV/AIDS**  
**Source:** Jefferis, Keith, 2006; Pg. 58.

Figure 4.1 shows that out of the 25 companies 52% had a significant drop in both productivity and output. 20% showed a marginal drop in productivity and 28% showed no impact on productivity due to the HIV/AIDS pandemic. Also 28% had a marginal decrease in output and only 20% show no impact in output due to the HIV/AIDS pandemic.

### **Health Care Cost**

Firms in Botswana are also battling large health care costs. In a study done in Botswana on two companies, Botswana Diamond Valuing Company and Botswana Meat Commission, each company was spending \$125,941 and \$370,200<sup>17</sup> (USD) respectively on HIV/AIDS prevention each year. This came out to be \$237 and \$268 (USD) annually on each employee. To combat these growing costs companies are using several different options. First, some companies are dropping their health care package, which is the cheapest but leaves employees vulnerable and does not fix any labor problems discussed above. Secondly, many companies are providing a health care package where the employee will pay a percentage of the yearly cost. Lastly, and the most effective way to solve the problem, companies are setting up health care packages that include health care along with education programs. Employees are learning about healthier living, sex education, free testing, and medication. A study done by the Overseas Development Institute found that companies were having an average return of \$3 for every \$1 (USD) spent<sup>18</sup>. After implementing these types of programs companies were seeing less absenteeism, better production, and decreased employee turnover.

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<sup>17</sup> See Work Cited: Stover, John., Bollinger, Lori, September 1999, Pg. 6.

<sup>18</sup> See Work Cited: Overseas Development Institute, 2007; Pg. 2.



## **Investment**

Lastly, over the past 50 years Botswana has been trying to diversify its economy away from mining, which is the largest sector of the economy. Manufacturing, tourism, transportation, and the financial sector have all been trying to expand. The problem these sectors are facing is that foreign and domestic investment is low. Domestic investment is low due to low savings rate and possibly domestic social moral. International investment could be low due to several reasons. Labor issues such as amount of skilled vs. unskilled workers, fluctuation in employment, unknown future cost and revenues, and long-term political/social prosperity all deter prospective investors.

Investment is a very important part of factors of production. Botswana has good stocks of natural resources, but investment along with labor is slowing economic growth. Without domestic or international investment individuals firm growth relies on growth in productivity, output, and sales which have seen to be decreasing. So, without a change in investment, both domestically and internationally, factors of production are declining and economic growth will struggle.

## **CHAPTER 5 - The Economic Impact on Agriculture by HIV/AIDS**

### **General Information**

Agriculture is an important sector in almost all African countries and normally agriculture employees comprise the largest percentage of the population. For the most part the techniques used have been passed down from generation to generation so they are very traditional. Farmers use little machinery, irrigation, and fertilizer when farming. Due to this, farms are kept small and are worked on by the family or small village. Many of the farms are subsistence farms and the people who work the ground require the agriculture output for survival, which makes it essential for everything to run smoothly. The HIV/AIDS pandemic has negatively impacted many rural African farms and forced many farmers to migrate to urban areas. The pandemic can negatively impact agriculture in many ways. First, farming in Africa is very labor intensive and the loss of a single worker can mean the difference in a year's crop, especially during important times such as harvest and planting. Secondly, traditional farming techniques can be lost if not passed down, which can cause the adoption of a lower yielding technique. Third, a drop in output caused by either of the above can force families into poverty. Lastly, as farms begin to fail many will begin to sell off livestock to eat or pay medical bills.

### **Agriculture in Botswana**

Although Botswana's economy has been relatively good compared to other African countries, its agriculture sector is still struggling. Today Botswana has roughly 70% of its labor force employed in agriculture, but only around 3% of GDP is generated from agriculture<sup>19</sup>. As

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<sup>19</sup>See Work Cited: Malope, P., Goboswang, K., Gabaitre, P. Ntseane, P. Measuring, 2007; Pg. 28.

discussed throughout this paper, Botswana has a high population infected with HIV/AIDS and the labor supply has been negatively impacted. Large percentages of the work force live in rural settings working as farmers. Botswana has seen a negative growth rate in agriculture production. In 1966 agriculture accounted for 40% of GDP and now it is 3%. This decline has stemmed from various factors such as natural causes like drought, floods, soil quality, and recently HIV/AIDS. A study done by the Botswana College of Agriculture showed HIV/AIDS as having a negative impact. The study randomly selected 3 villages from different regions of the country and then took a sample of 187 households. The survey found that 101 households had been affected and 86 households had not been affected. From these two groups they collected data on crop production, output, and livestock. Below table 5.1 and 5.2 display the results of the study.

Affected Households	Number of 50 kg Bags
Before Illness	30.38 bags
After Illness	7.54 bags

**Table 5.1: Grain Output in Botswana**

**Source:** Malope, P., Goboswang, K., Gabaitre, P. Ntseane, P. Measuring, 2007; Pg. 8.

Study Group	Mean (Std. Dev.)
Not Affected	27.0 (26.7)
Before Illness	35 (30.9)
After Illness	20.0 (23.1)

**Table 5.2: Mean Distribution of Livestock by Population Type**

**Source:** Malope, P., Goboswang, K., Gabaitre, P. Ntseane, P. Measuring, 2007; Pg. 8.

As shown in table 5.1 and 5.2 you can see there is a clear drop in grain production output caused by HIV/AIDS. There was roughly a 22 unit difference in 50 kg bags after the illness. That is roughly 1100 kg difference in food production over a one year period, which is substantial. Also, livestock production and ownership has dropped for farmers by an average of 15 animals, which again is substantial. It was unclear in the study if this drop came from selling the animals for money or using them as a source of food. Farmers in the study concluded that 61% of the time their agriculture production dropped because of illness or lack of labor. Both of these could be directly linked to damage caused from HIV/AIDS.

Reason	Frequency	Percentage
Lack of Draught	29	17.8
Lack of Labor	60	36.8
Draught	12	7.4
Illness in House	40	24.6
Other	22	13.5
Total	163	100

**Table 5.3: Explanation for Decrease in Agriculture Output**

**Source:** Malope, P.,Goboswang, K., Gabaitre, P. Ntseane, P. Measuring, 2007; Pg 8.

Lastly, the study revealed one more important statistic which could turn out to be an alarming long-term negative impact HIV/AIDS is having on the economy of Botswana. In a regression analysis it was shown that crop output was 3.4 times higher for males than females.<sup>20</sup> This is troubling because about half of Botswana's households are headed by females.

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<sup>20</sup> See Work Cited: Malope, P.,Goboswang, K., Gabaitre, P. Ntseane, P. Measuring, 2007; Pg. 8.

## **CHAPTER 6 - The Economic Impact HIV/AIDS is having on Education**

Like most sectors in an economy, the impact of the HIV/AIDS pandemic has caused a reversal in progress of education. Education systems throughout Africa are struggling to keep children in the classroom and quality of education from declining. As stated by Abt. Associates in a report done on Botswana's education sector, "the sector needs to produce increasing numbers of students who are equipped to fill the gaps left by AIDS in households, communities and the workforce, and to maintain and improve the fabric of a traumatized Botswana society."<sup>21</sup> Although this is the goal for the education, it is not the case everywhere in Botswana. There are several factors that are causing a decline in the education sector. This section will separate and explain each factor. First, we will look at how the demand for education by children has impacted education. Secondly, we will look at supply and demand problems in the teacher market.

### **Demand for Elementary Education**

There are several factors that are causing a decrease in demand for education throughout Africa. Over the past couple decades HIV/AIDS has torn apart the family structure. Many families have lost love ones and suffer the economic hardship felt by loss of income. As discussed earlier, 300,000 people are infected in Botswana. This population is heavily dependent on extended family to survive as they become sick and are no longer able to work. Many times when adults become sick their children will be forced out of formal education in order to work. A study done in Africa showed that 56 out of 215 students had to leave their school to work.

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<sup>21</sup>See Work Cited: Kingborn, Anthony., Coombe, Carol., McKay, Elaine., Johnson, Saul; 2002.

This creates long-term problems for the economy of Botswana which has around double the amount of unskilled labor.<sup>22</sup> Due to the fact many people are living in poverty, death rates are high, and life expectancy is so low, social moral could be low causing people to reduce returns on education.

The next problem associated with a decrease in demand for education is the growing orphan population. The number of orphans in Botswana has progressively grown over the past 10 years. In 2000 there was an estimated 38,000 orphans, 101,000 in 2005, and 161,000 in 2010,<sup>23</sup> many of these kids do not receive social support from the government and eventually drop out of school in search of a living. Also, many times orphans have physiological problems associated with the loss of a parent or feel like an outcast by normal society's standards. Abt. Associates concluded in their study that orphans are 37% less likely to enroll in school.

Although Botswana has a good education compared to many other African countries, children affected by AIDS are going to decrease the enrollment rate and the ratio of skilled to unskilled workers is going to continue to decrease.

### **Teachers Supply & Education Quality**

AIDS has negatively impacted the ability of many countries to supply its children with a quality education. Through a reduction in supply of educated teachers, absenteeism, and teacher migration, the education sector in many regions is declining. In a study done on African countries it was concluded that teachers in many communities seem to have higher HIV infection rates than that within the community.<sup>24</sup> Although the study said it was unclear what variable

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<sup>22</sup> See Work Cited: Jefferis, Keith, 2006; Pg. 41.

<sup>23</sup> See Work Cited: Kingborn, Anthony., Coombe, Carol., McKay, Elaine., Johnson, Saul, 2002.

<sup>24</sup> See Work Cited: Kingborn, Anthony., Coombe, Carol., McKay, Elaine., Johnson, Saul, 2002.

caused the higher rate. As teachers become ill, they will begin using more sick days. An empirical research study found that infected teachers lose six months of work prior to the HIV virus turning into full blown AIDS and 12 months after. Increased absenteeism places a burden on schools to find a replacement, which increases cost and decreases quality of education. The quality of education has become progressively worse over the past two decade since the number of teachers dying is increasing. As teachers die or leave the educational work force they take with them the skills and knowledge of teaching. Currently in Botswana, teacher turnover is around 14% annually and by 2010 the death rate annually for teachers will be 1.7% to 5%. To combat these problems schools are required to hire substitute teachers or hire new ones, which leads into the next problem. Funding is an emerging issue. First, it is costly to train new teachers and resources are very limited in most schools. Also, in many countries, schools are required to pay employee benefits until the employee has died. So many times they might be paying for substitute teachers while paying sick teachers. As it becomes more expensive to run educational institutions, schools might begin hiring less qualified teachers to reduce costs and thus quality will also be reduced.

# **CHAPTER 7 - The Economic Impact HIV/AIDS is having on the Health Care System**

## **General Information**

Next, the health care sector in most African countries is not adequate to fight HIV/AIDS. There are many problems affecting the health care system and they resemble the problems within the education system. First, there is a supply problem of not enough good doctors. Secondly, there is a supply problem with not enough medicine and medical facilities. Due to these problems many African countries have sent out cries for help to the international community.

Throughout Africa there is a shortage of qualified doctors. This problem is two sided, first many doctors are sick themselves and are struggling with AIDS. Second, many have moral problems or are scared to work under the conditions faced with when dealing with AIDS victims. The United Nations Department of Economic and Social Affairs reports that a country with 5% HIV infection rate will have around 1% of its health care providers die each year. Furthermore, a country with 30% infection rate will have 5% to 7% of its health care workers die<sup>25</sup>. With numbers this high it is easy to see why many doctors prefer to stay away from HIV/AIDS treatment and why there is a shortage of medical workers. A good health care system is very important in maintaining a developing society. The HIV/AIDS pandemic has affected all parts of society, not just the poor, and must be dealt with.

Antiretroviral medication is the only known medicine to slow the AIDS virus. These drugs are very expensive and hard for developing countries to afford to. As of early 2000, it cost \$10,000 (USD) to treat an infected person for one year. These prices have drastically decreased

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<sup>25</sup> See Work Cited: The Impact of Aids, 2004; Pg.75.



due to lobbying, and as of late 2001 it cost only \$350 (USD)<sup>26</sup>. Although this price is only about 4% of the previous price, countries are not able to allocate enough resources to combat the problem.

## **Health Care in Botswana**

Currently Botswana is trying to create a health care plan that would allow citizens infected with HIV/AIDS to have access to antiretroviral drugs. The government spent around 481 million Pula in 2003 on antiretroviral drug and prediction from Econsult they plan to increase that amount 1.2 billion Pula by 2021. Outside donor support from Bill & Melinda Gates Foundation and Merck & Co. account for around 20% of annual support<sup>27</sup>. The government seems believe the return on antiretroviral medication is very cost affective and believes the by 2021 GDP could rise by 7.6 billion Pula a year through saving lives and reducing employee illness.

Also in 2002, the government of Botswana decided to start a coalition with private domestic companies such as Debswana, a diamond manufacture, and create the National AIDS Coordinating Agency. Both parties have helped create public clinics which have treated over 30,000 outpatient appointments. Since then many other public clinics have been created through joint effort between government agencies and domestic businesses.

Lastly on health care, if you consider health care or quality of health care in a country as a final output then one can see how the factors of production are affecting the final output. Again like any of the other topics discussed throughout this essay, labor, human capital, and investment are lacking causing a less then optimal health care system. If it was not for the HIV/AIDS

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<sup>26</sup> See Work Cited: The Impact of AIDS, 2004; Pg. 78.

<sup>27</sup> See Work Cited: The Impact of AIDS, 2004; Pg. 89.

pandemic as discussed above it seems clear that these problems would not be as severe. Africa in general and Botswana are examples of less developed countries and until the continent can fix the decrease in qualified health care physicians and funding problems the health care system will most likely not reach the capacity it could if the health care factors of production were not affected by the HIV/AIDS pandemic.

## **CHAPTER 8 - Macroeconomic Impacts caused by HIV/AIDS**

### **Possible Impacts**

The HIV/AIDS pandemic is and has had an effect on the growth of the economies in Africa. Although it is very hard to be certain exactly how much it has affected Africa's economies or how much more damage it will cause in the future. The trouble on calculating loss stems from the ability to decide on what should be included in calculating overall loss. The one thing that is for certain is that the HIV/AIDS pandemic has had a significant impact on Africa's economies.

To begin, it is important to consider all the possible impacts in order to build a scenario. Many times when large scale situations occur, such as AIDS or the housing bust in the US, resources are not allocated properly in an economy. In the case of Botswana it is very clear that the labor force growth rate will slow in the next 10 to 15 years due to the large number of people infected by the virus and facing inevitable death. When looking at the hardships brought on by the AIDS pandemic such as a decreased labor force, high health care costs, and a reduction in education, it seems as though Africa is destined for hardship. Econsult stated that there would be around 300,000 less workers in 2020 due to the impact of AIDS. With a reduction in the labor force (especially skilled labor), production is going to slow. As production slows and becomes less efficient there will be fewer sales, thus reducing incomes throughout the country. If the lower incomes are coupled with high medical expenses then a scenario is built for a drastic decrease in savings and investment, both private and public. Economies will most likely begin to distribute resources inefficiently around the economy trying to finance the cost of fighting the pandemic. Both the rich and the poor will most likely be affected unless previous savings are available. As mentioned earlier investments will be low domestically due to very little savings

and international investments will most likely be minimal due to the risk of the investments and uncertainty for the future of Africa.

## **GDP**

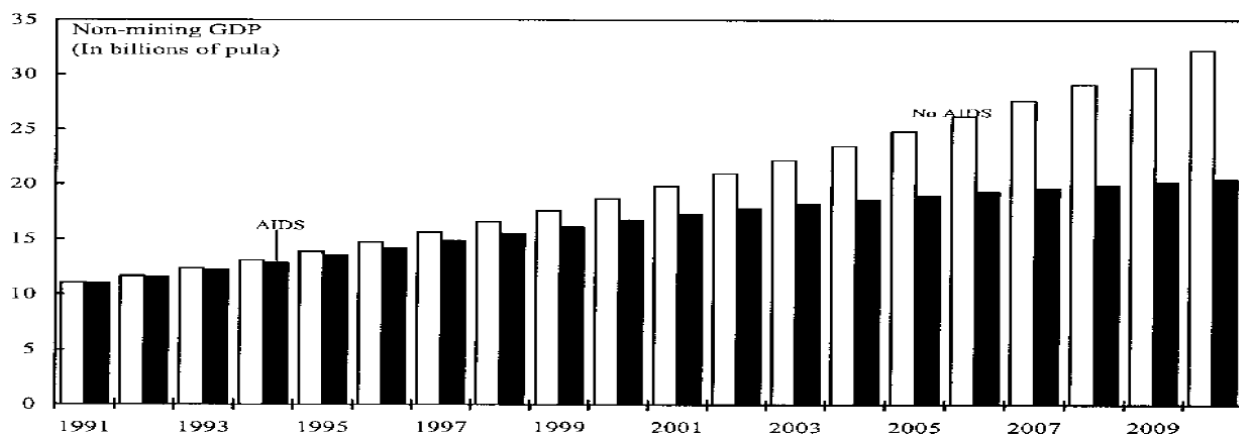
There have been several models created to predict the current and future impact of AIDS in Africa. Most models differ in the number of predictors which are included and how much weight is placed on informal vs. formal job sectors. Although all models agree that Africa's economies are going to have a decrease in GDP from 1% to 5% per year, these numbers are not huge when looking in the short-run, but as AIDS is a long term (10-15 years) virus these decreases could drop some countries GDP by 15% to 30%.<sup>28</sup> Where most models differ is in GDP per capita. The difference is the amount of deaths and the population growth rates which occur in the coming years. If several million die then perhaps the per capita GDP might not be affected all that much, but this assumption depends on what sectors are hit the hardest, low income or high income workers. If more low income workers die then per capita GDP will remain steady where as if thousands of high income employees die, their income, which makes up a majority of the GDP, will decrease per capita GDP. A study done by Botswana's Ministry of State President National AIDS Coordinating Agency found the average real income will increase by 1.4% per year instead of 2.2% due to AIDS, which over 20 years will be a 14% difference.

According to the International Monetary Fund, Botswana's GDP is in line with the average in Africa, averaging a decrease between 1% and 4% per year. This is due to the destruction caused by AIDS and possibly to the structure of the economy. Botswana has an

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<sup>28</sup> See Work Cited: The Impact of Aids, 2004; Pg.85.

abundance of natural resources. Currently mining accounts for roughly 60% of the GDP and accounts for 30% of output<sup>29</sup>. The abundance of natural resources has helped Botswana economically as mining funds much of the country's social welfare and revenue, but there is a down side. Mining capacity is maxed so further sectors of the economy need to be exploited to turn around GDP growth. Below figure 8.1 and 8.2 provide insight into Botswana's non-mining sectors.



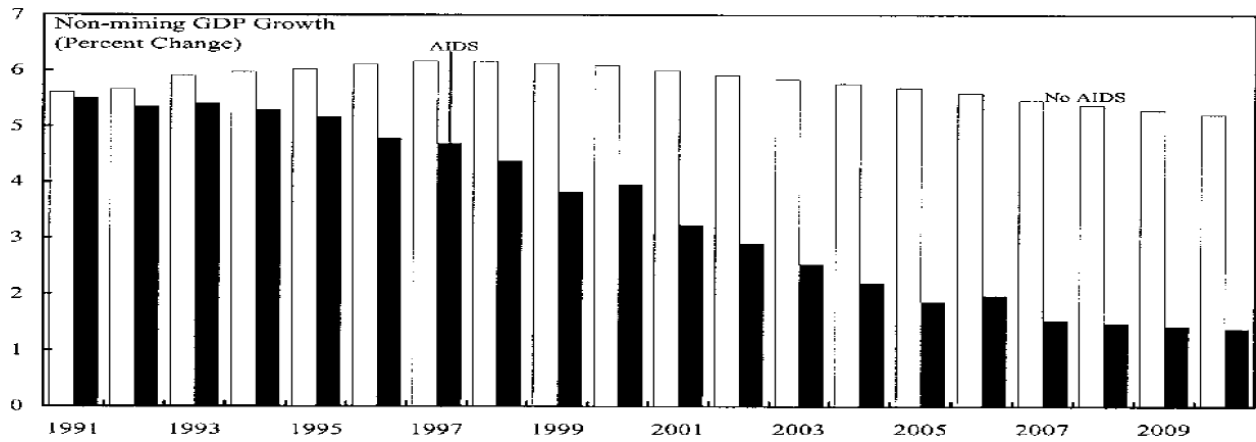
**Figure 8.1: Non-Mining GDP**

**Source:** Sgherri, Silvia., MacFarlan, Maitland, 2001; Pg. 18.

From figure 8.1 one can gain insight into the negative factors affecting GDP. First, it is clear the HIV/AIDS pandemic is having an adverse effect on non-mining GDP shown by the gap between the white and black boxes. Secondly, one can see that average annual growth in the non-mining sector is beginning to slow. This is reinforced when looking at figure 8.2, which again shows a negative trend in GDP growth. Over the past ten years non-mining GDP has dropped

<sup>29</sup> See Work Cited: Sgherri, Silvia., MacFarlan, Maitland, 2001; Pg. 11.

roughly 4%. Although it is impossible to know all the factors causing the negative relationship one could assume that many of the factors talked about throughout this paper all play a role.



**Figure 8.2: Non-Mining GDP Growth**

**Source:** Sgherri, Silvia., MacFarlan, Maitland, 2001; Pg. 18.

## **CHAPTER 9 - Possible Solutions**

### **HIV/AIDS Pandemic**

The most important action to stop future economic problems associated with HIV and AIDS is to prevent future spread of the virus. Countries can do nothing besides treat people already infected, but future growth requires a healthy population. Prevention can come in hundreds of different ways, but the most important is education. Educational programs can be very effective and if children are taught young enough, there is a good chance they will remain aware of the risk. Education programs need to inform people what HIV/AIDS is and how it is transmitted. This should include practices of safe sex and abstinence. Also, people should learn how to live a healthy lifestyle nutritionally, physiologically, and socially. Lastly, people need to learn the value of education because educated citizens will be less likely to put themselves in a dangerous situation.

Next, programs need to be developed to take care of at risk people. This would include orphans, care takers, babies, and people who are sick. As discussed earlier, predictions show that there will be an estimated 161,000 orphans by 2010 in Botswana. There needs to be programs created to help support them, such as foster care or community living. If orphans could get shelter, food, financial support, and subsidized education there would be less of a chance that they would live a life on the street where there is an increased chance of transmission. Next, sick mothers need to be educated on ways to reduce the transmission to infants. This includes being aware of blood transmission in bodily fluid such as breast milk. Lastly, public and private health care programs need to be set up in both rural and urban areas. A study in Francistown showed that alternate healthcare providers were effective due to the fact many sick people were reluctant to attend government health clinics.

## **Economic Changes**

Following from the previous section, governments need to group with big businesses and pharmaceutical companies to lower the cost of antiretroviral drugs. This will lower the amount of government spending as part of GDP on the AIDS pandemic and allow the government to help other sectors such as small business.

Small business and manufacturing are hurting due to fewer skilled workers and decreased productivity. Governments could relax their laws on foreign workers which would allow companies more access to more skilled workers. Alternative governments could subsidize training costs for firms. This would increase human capital in the country and allow small businesses to be more productive. Also, the government needs to increase investment in the country. Without investment, unemployment, wages and GDP will remain stagnant.

At the firm level, companies need to take an active approach in reducing the impact of HIV/AIDS. This will include programs that promote healthy living. There could be support groups, educational classes, and healthy living programs. Companies who have adopted these programs in South Africa have found a \$3 to \$1 (USD) return on investment of employee health<sup>30</sup>.

## **Social Changes**

At the social level many African countries need to change. First and foremost, the role and status of women in society needs to change. Women need to have equal rights as men. This

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<sup>30</sup> See Work Cited: Overseas Development Institute, 2007; Pg. 2.



will help lower crimes and abuse which will in turn help lower the rate of HIV/AIDS transmission. Also, women need to be taught how to practice safe sex and the use of condoms.

Moreover, counseling programs need to be created for several reasons. First, families who have lost loved ones from the HIV/AIDS pandemic could have physiological issues. Secondly, marriage counseling or dating counseling could be affective. Many African males travel several days a month working on the road and many become infected from prostitution. Counseling could help change the way males think while away from their family.

Lastly, the legal system in Africa needs to step up their fight to stop HIV/AIDS. Stiffer penalties need to be handed down to adults dealing in the sex business. Also, males who are found abusing children or women need to be removed from society so they cannot put other citizens at risk.

## **CHAPTER 10 - Conclusion**

To conclude, the Human Immunodeficiency Virus and Acquired Immune Deficiency Disease has become one of the worst killers in the modern day world. The HIV/AIDS pandemic has affected all parts of the world, although it seems that sub-Saharan Africa has been hit the worst. Currently, around 23 million Africans are infected with the virus and it is the leading cause of death in the region. There are several reasons for Africa's severe problem with AIDS. Societal characteristics, civil unrest, poor education, extreme poverty, and poor health care systems have all helped spread the HIV/AIDS virus. As the virus spreads so does economic hardship. Many studies have been done on the economic impact of HIV/AIDS in Africa and although many studies do not agree with each other one thing is certain, HIV/AIDS is having a negative impact on all Sub-Saharan countries. This essay has looked at various economic sectors to see just how HIV/AIDS is affecting economies of Africa. Sectors such as agriculture, household, demographic, business, education, and macroeconomic indicators were used to conclude that HIV/AIDS is and is projected to have, adverse effects on Africa and Botswana.

To begin, HIV/AIDS has caused the demographic makeup of the country to change. The pandemic has caused average life expectancy to drop severely and in the case of Botswana, almost 20 years. This has caused many countries to have 1/3 or more of its population under the age of 15. This has created extreme labor force problems. Countries are losing their skilled workers at a very young age and are required to substitute with young unskilled workers. Children are being pulled from school to provide for their family or themselves if they have been orphaned by HIV/AIDS. In Botswana HIV/AIDS is expected to lower the labor force by 300,000 workers by 2010. As of 2003 it was estimated that only 30% of the labor force was skilled and the ratio of skilled to unskilled was supposed to increase.

Firms in the economy were impacted several ways. First, skilled labor shortages and absenteeism were decreasing productivity and output, and in addition absenteeism is raising cost. Firms were also being hit hard by health care costs and in some cases firms had to stop offering health care packages to stay competitive. Due to the fact revenues and costs were unpredictable, skilled labor was scarce, savings was down, and new investments were minimal.

Agriculture production and output in Botswana had also been negatively affected from HIV/AIDS. Annual agriculture output dropped to 24% of original output and livestock production dropped by 15 animals per year after illness. When the farmers were interviewed on what caused the decrease, they explained that around 50% of the time it was due to illness or lack of labor.

Households were impacted through the loss of life caused by AIDS. When death occurs there is a decrease in income and an increase in expenses. Many households in Africa are in poverty or close to poverty so the loss on income drives them deeper into poverty. Many times children will be orphaned or forced out of school to support the sick loved one and the family, which is one of the main problems with education.

Furthermore, both the health care sector and the education sector are suffering from similar problems. Doctors and school teacher are also becoming infected with the virus and both sectors are seeing a loss in experienced workers. This makes it hard to find qualified replacements, which has somewhat decreased the quality of service.

Due to all of the harmful impacts caused by HIV/AIDS, many economic indicators in Botswana have seen a negative growth trend. Expected GDP growth is expected to drop from 5 ½% to around 2% annually due to AIDS by 2010, which could drop total GDP 15%-20%. Also, a study done by Botswana's Ministry of State President National AIDS Coordinating Agency

found the average real income will be 1.4% per year instead of 2.2% due to AIDS, which over 20 years will be a 14% decrease.

In conclusion, after all the evidence is presented it is clear that HIV/AIDS is negatively impacting Botswana's economy. The factors talked about throughout the essay are felt in many countries in Africa. Due to this it is very important for governments to look at ways to stop the growing problem and return their economies to the pre-AIDS level of prosperity. This challenge will not be easy, but if countries learn from one another progress will be made.

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